

Search Plan and Results

Question

[What is the relationship between dietary potassium intake and blood pressure in adults? \(DGAC 2010\)](#)

Date Searched

Jan 2000 - Nov 2009

Inclusion Criteria

- Randomized controlled trials: 2000 to 2009 adults (19 and older)
- Human subjects
- English language
- International
- Sample size: Minimum of 10 subjects per study arm; preference for larger sizes, if available
- Dropout rate: Less than 20%; preference for smaller dropout rates
- Ages 19 years and older; using research for adults and elderly
- Populations: Healthy and those with elevated chronic disease risk (hypertension, CHD and CVD, Type 2 diabetes mellitus, metabolic syndrome and obesity).

Exclusion Criteria

- Medical treatment or therapy
- Diseased subjects (already diagnosed with disease related to study purpose)
- Hospitalized patients
- Malnourished or third-world populations or disease incidence not relative to US population (e.g., malaria)
- Animal studies
- In vitro studies
- Cohort and case-control studies
- Articles not peer reviewed (Web site, magazine articles, Federal reports, etc.).

Search Terms: Search Vocabulary

("Hypertension"[mh] OR "blood pressure"[MeSH Terms]) AND ("Potassium"[mh] OR "Potassium, Dietary"[mh] OR potassium[majr])

Electronic Databases

Total hits from all electronic database searches: 410

Total articles identified to review from electronic databases: 25

Articles Identified Via Handsearch or Other Means

Four systematic reviews or meta-analyses identified by hand search from reference list in:

Institute of Medicine. *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate*. Washington, DC: The National Academies Press; 2005.

Summary of Articles Identified to Review

Number of Primary Articles Identified: 5

Number of Review Articles Identified: 5

Total Number of Articles Identified: 10

Number of Articles Reviewed but Excluded: 19

List of Articles Included for Evidence Analysis

Systematic Review and Meta-analysis

Burgess E, Lewanczuk R, Bolli P, Chockalingam A, Cutler H, Taylor G, Hamet P. [Lifestyle modifications to prevent and control hypertension. 6. Recommendations on potassium, magnesium and calcium. Canadian Hypertension Society. Canadian Coalition for High Blood Pressure Prevention and Control. Laboratory Centre for Disease Control at Health Canada. Heart and Stroke Foundation of Canada. CMAJ.](#) 1999 May 4; 160(9 Suppl): S35-S45. PMID: 10333852 (Hand search from DRI 2005.)

Cappuccio FP, MacGregor GA. [Does potassium supplementation lower blood pressure? A meta-analysis of published trials.](#) *J Hypertens.* 1991 May; 9(5): 465-473. PMID: 1649867 (Hand search from DRI 2005.)

Dickinson HO, Nicolson DJ, Campbell F, Beyer FR, Mason J. [Potassium supplementation for the management of primary hypertension in adults.](#) *Cochrane Database Syst Rev.* 2006 Jul 19; 3: CD004641.

Geleijnse JM, Kok FJ, Grobbee DE. [Blood pressure response to changes in sodium and potassium intake: A metaregression analysis of randomised trials.](#) *J Hum Hypertens.* 2003 Jul; 17 (7): 471-480. PMID: 12821954. (Hand search from DRI 2005.)

Whelton PK, He J, Cutler JA, Brancati FL, Appel LJ, Follmann D, Klag MJ. [Effects of oral potassium on blood pressure. Meta-analysis of randomized controlled clinical trials.](#) *JAMA.* 1997 May 28; 277 (20): 1, 624-1, 632. PMID: 9168293. (Hand search from DRI 2005.)

Primary Studies

Braschi A, Naismith DJ. [The effect of a dietary supplement of potassium chloride or potassium citrate on blood pressure in predominantly normotensive volunteers.](#) *Br J Nutr.* 2008 Jun; 99 (6): 1, 284-1, 292.

He FJ, Markandu ND, Coltart R, Barron J, MacGregor GA. [Effect of short-term supplementation of potassium chloride and potassium citrate on blood pressure in hypertensives.](#) *Hypertension.* 2005 Apr; 45 (4): 571-574. Epub 2005 Feb 21.

He J, Gu D, Chen J, Jaquish CE, Rao DC, Hixson JE, Chen JC, Duan X, Huang JF, Chen CS, Kelly TN, Bazzano LA, Whelton PK; GenSalt Collaborative Research Group. [Gender difference in blood pressure responses to dietary sodium intervention in the GenSalt study.](#) *J Hypertens.* 2009 Jan; 27 (1): 48-54.

Hilary Green J, Richards JK, Bunning RL. [Blood pressure responses to high-calcium skim milk and potassium-enriched](#)

[high-calcium skim milk](#). *J Hypertens*. 2000 Sep; 18 (9): 1, 331-1, 339.

Tuekpe MK, Todoriki H, Sasaki S, Zheng KC, Ariizumi M. [Potassium excretion in healthy Japanese women was increased by a dietary intervention utilizing home-parcel delivery of Okinawan vegetables](#). *Hypertens Res*. 2006 Jun; 29 (6): 389-396.

List of Excluded Articles with Reason

Article	Reason for Exclusion
Ando K, Matsui H, Fujita M, Fujita T. Protective effect of dietary potassium against cardiovascular damage in salt-sensitive hypertension: Possible role of its antioxidant action. <i>Curr Vasc Pharmacol</i> . 2010 Jan 1.	Publication is theoretical.
Beyer FR, Dickinson HO, Nicolson DJ, Ford GA, Mason J. Combined calcium, magnesium and potassium supplementation for the management of primary hypertension in adults. <i>Cochrane Database Syst Rev</i> . 2006 Jul 19; 3: CD004805.	Does not answer question: Examined combinations of mineral supplements.
Buyck JF, Blacher J, Kesse-Guyot E, Castetbon K, Galan P, Safar M, Hercberg S, Czernichow S. Differential associations of dietary sodium and potassium intake with blood pressure: A focus on pulse pressure. <i>J Hypertens</i> . 2009 Jun; 27 (6): 1, 158-1, 164.	Study design is cross-sectional.
Chang HY, Hu YW, Yue CS, Wen YW, Yeh WT, Hsu LS, Tsai SY, Pan WH. Effect of potassium-enriched salt on cardiovascular mortality and medical expenses of elderly men. <i>Am J Clin Nutr</i> . 2006 Jun; 83 (6): 1, 289-1, 296.	Does not included blood pressure (BP) in analyses.
Charlton KE, Steyn K, Levitt NS, Zulu JV, Jonathan D, Veldman FJ, Nel JH. Diet and blood pressure in South Africa: Intake of foods containing sodium, potassium, calcium, and magnesium in three ethnic groups. <i>Nutrition</i> . 2005 Jan; 21 (1): 39-50.	Study design is cross-sectional.
Cohen DL, Townsend RR. What effect does potassium have on blood pressure? <i>J Clin Hypertens (Greenwich)</i> . 2008 Feb; 10 (2): 158-159.	Publication is editorial.
Cook NR, Obarzanek E, Cutler JA, Buring JE, Rexrode KM, Kumanyika SK, Appel LJ, Whelton PK. Joint effects of sodium and potassium intake on subsequent cardiovascular disease: The Trials of Hypertension Prevention follow-up study. Trials of Hypertension Prevention Collaborative Research Group. <i>Arch Intern Med</i> . 2009 Jan 12; 169 (1): 32-40.	Does not include BP in analyses.
Delgado MC, Delgado-Almeida A. Red blood cell potassium and blood pressure in adolescents: A mixture analysis. <i>Nutr Metab Cardiovasc Dis</i> . 2002 Jun; 12 (3): 112-116.	Study population was adolescents.
Di Legge S, Spence JD, Tamayo A, Hachinski V. Serum potassium level and dietary potassium intake as risk factors for stroke. <i>Neurology</i> . 2003 Jun 10; 60 (11): 1, 870. Comment on: <i>Neurology</i> . 2002 Aug 13; 59(3): 314-320.	Does not include BP in analyses.
Gu D, Rice T, Wang S, Yang W, Gu C, Chen CS, Hixson JE, Jaquish CE, Yao ZJ, Liu DP, Rao DC, He J. Heritability of blood pressure responses to dietary sodium and potassium intake in a Chinese population. <i>Hypertension</i> . 2007 Jul; 50 (1): 116-122.	Does not include BP as an independent variable. Focus was heritability of BP response.
Jan RA, Shah S, Saleem SM, Waheed A, Mufti S, Lone MA, Ashraf M. Sodium and potassium excretion in normotensive and hypertensive population in Kashmir. <i>J Assoc Physicians India</i> . 2006 Jan; 54: 22-26.	Study design is case control.

Maldonado-Martín A, García-Matarín L, Gil-Extremera B, Avivar-Oyonarte C, García-Granados ME, Gil-García F, Latorre-Hernández J, Miró-Gutiérrez J, Soria-Bonilla A, Vergara-Martín J, Javier-Martínez MR. Blood pressure and urinary excretion of electrolytes in Spanish schoolchildren. <i>J Hum Hypertens</i> . 2002 Jul; 16 (7): 473-478.	Study population is children.
Mu JJ, Liu ZQ, Liu WM, Liang YM, Yang DY, Zhu DJ, Wang ZX. Reduction of blood pressure with calcium and potassium supplementation in children with salt sensitivity: A 2-year double-blinded placebo-controlled trial. <i>J Hum Hypertens</i> . 2005 Jun; 19 (6): 479-483.	Study population is children.
Nowson CA, Morgan TO, Gibbons C. Decreasing dietary sodium while following a self-selected potassium-rich diet reduces blood pressure. <i>J Nutr</i> . 2003 Dec; 133 (12): 4, 118-4, 123.	Both interventions are potassium-rich.
Pikilidou MI, Lasaridis AN, Sarafidis PA, Tziolas IM, Zebekakis PE, Dombros NV, Giannoulis E. Blood pressure and serum potassium levels in hypertensive patients receiving or not receiving antihypertensive treatment. <i>Clin Exp Hypertens</i> . 2007 Nov; 29 (8): 563-573.	Study examined effect of diuretics.
Smith NL, Lemaitre RN, Heckbert SR, Kaplan RC, Tirschwell DL, Longstreth WT, Psaty BM. Serum potassium and stroke risk among treated hypertensive adults. <i>Am J Hypertens</i> . 2003 Oct; 16 (10): 806-813.	Study design is case control.
Umesawa M, Sato S, Imano H, Kitamura A, Shimamoto T, Yamagishi K, Tanigawa T, Iso H. Relations between protein intake and blood pressure in Japanese men and women: The Circulatory Risk in Communities Study (CIRCS). <i>Am J Clin Nutr</i> . 2009 Aug; 90 (2): 377-384.	Does not include dietary potassium intervention.
Walsh CR, Larson MG, Vasan RS, Levy D. Serum potassium is not associated with blood pressure tracking in the Framingham Heart Study. <i>Am J Hypertens</i> . 2002 Feb; 15 (2 Pt 1): 130-136.	Does not include dietary potassium intervention.
Zhao Q, Gu D, Chen J, Bazzano LA, Rao DC, Hixson JE, Jaquish CE, Cao J, Chen J, Li J, Rice T, He J. Correlation between blood pressure responses to dietary sodium and potassium. Intervention in a Chinese population. <i>Am J Hypertens</i> . 2009 Sep 17.	Does not include dietary potassium intervention